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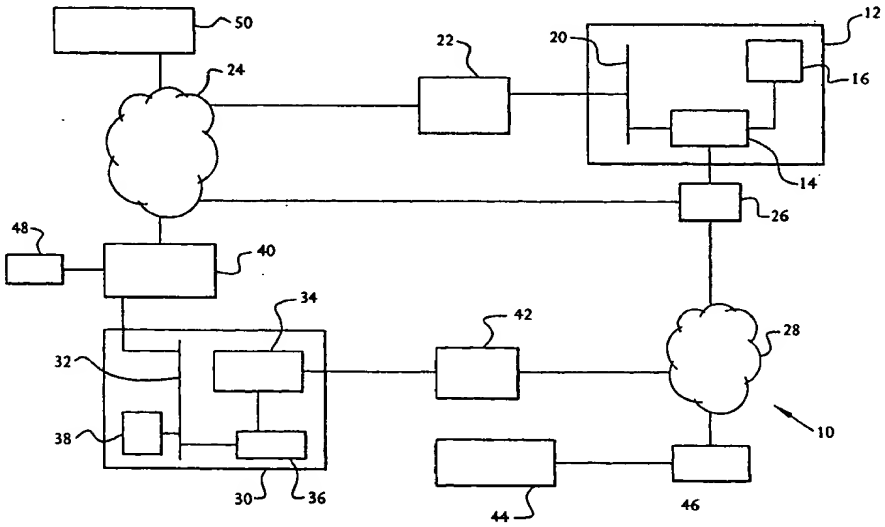

(57) Abstract

The present invention is directed to an apparatus and process for enabling and selecting Internet fax transmission when a fax recipient (36) is equipped to receive Internet (24) faxes. The present invention includes a processor (62) programmed to search a local database maintained in a storage element (66) to determine if the fax recipient (36) is equipped to receive an Internet fax. The processor (62) is also programmed to search a central database maintained at a central management station (50) to determine if the fax recipient (36) is equipped to receive an Internet fax. If the fax recipient if found in either database (66 or 50), the fax is packaged for transmission over the Internet (24) and transmitted to the recipient (36). If the fax recipient is not found in either of the databases (66 or 50), the fax is packaged for transmission over the public telephone network (28) and transmitted to the recipient (36).

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APPARATUS AND PROCESS FOR ENABLING INTERNET FAXING

Field of the Invention

The present invention is directed to the general field of apparatus and methods for transmitting data via a facsimile device. More particularly, the present invention is directed to an apparatus and process for selectively transmitting data input to a facsimile machine via the Internet or public telephone lines.

Background of the Invention

The use of facsimile devices, also known as fax machines, to transmit data over public telephone lines is well known. It is common practice to feed a document into a fax machine which scans the document and generates a graphic image file of fax data, packages the graphic image file for transmission, inputs a receiving fax number, and transmits the packaged data over the telephone lines. A standard G3 protocol is used to establish a connection between the sending fax machine and the receiving fax machine. Furthermore, a standard protocol can be used to package the graphic image file for transmission.

It is also more recently known to use the Internet to transmit fax data in order to bypass the public telephone lines and their associated costs. The known Internet fax systems utilize and rely upon a local database of records that associate an Internet address with a receiving fax machine, or an e-mail address with a receiving computer. The local database must be manually updated with new Internet addresses or e-mail addresses corresponding to a recipient fax number in order to send the fax data via the Internet. If the Internet address or e-mail address corresponding to a recipient fax number is not in the local database, the sender will not have the information needed to send the fax data via the Internet and will have

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to rely on the public telephone system. Thus, current Internet fax systems require a significant amount of time and energy to maintain an up-to-date local database of Internet and e-mail addresses.

Summary of the Invention

The present invention includes a method for enabling and selecting Internet fax transmission when a fax recipient has an Internet address. The method comprises the steps of receiving fax data from a fax machine, maintaining a local database of Internet fax-equipped recipients and searching the local database for the recipient telefax number. The fax data includes a recipient telefax number and a graphic image file. The local database includes a record for each Internet fax-equipped recipient, and each record includes a telefax number and an associated Internet address. If the recipient telefax number is in the local database, the method calls for packaging the graphic image file for transmission over the Internet to the Internet address associated with the recipient telefax number. If the recipient telefax number is not in the local database, the method calls for automatically querying a central database via the Internet to determine if the recipient telefax number is in the central database. If the recipient telefax number is in the central database, the method calls for receiving an Internet fax-equipped recipient record from the central database, updating the local database with the received record, and packaging the graphic image file for transmission over the Internet to the Internet address associated with the recipient telefax number of the record received from the central database. If the recipient telefax number is not in the central database, the method calls for packaging the graphic image file for transmission over the public telephone network to the recipient telefax number. Once the graphic image file is packaged, it is transmitted in accordance with its packaging format.

The present invention includes an apparatus for enabling and selecting Internet fax transmission when a fax recipient has an Internet address. The apparatus is a fax machine peripheral device that comprises an input for receiving data from a fax machine, an output for connecting to the Internet, an output for connecting to the public telephone network, a storage element

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maintaining a local database of Internet fax-equipped recipients, and a processor. The data from the fax machine includes a recipient telefax number and a graphic image file. The local database includes a record for each Internet fax-equipped recipient, and each record includes a telefax number and an associated Internet address. The processor is programmed to search the local database for the recipient telefax number. If the processor determines that the recipient telefax number is in the local database, it is programmed to package the graphic image file for transmission to the Internet address associated with the recipient telefax number, and transmit the packaged graphic image file over the Internet. If the processor determines that the recipient telefax number is not in the local database, it is programmed to query a central database via the Internet for the recipient telefax number. If the recipient telefax number is in the central database, the processor is programmed to receive an Internet fax-equipped recipient record from the central database, update the local database with the central database Internet fax-equipped recipient record, and package the graphic image file for transmission to the Internet address associated with the recipient telefax number received from the central database, and transmit the packaged graphic image file over the Internet. If the recipient telefax number is not in the central database, the processor is programmed to package the graphic image file for transmission over the public telephone network to the recipient telefax number, and transmit the packaged graphic image file.

Brief Description of the Figures

Figure 1 is a global diagram of the system of the present invention.

Figure 2 is a schematic diagram of a fax peripheral device of the present invention.

Figure 3 is flow chart of the process of the present invention.

Figure 4 is a flow chart of a subroutine of the process of Figure 3.

Figure 5 is a flow chart of a subroutine of the process of Figure 3.

Figure 6 is a flow chart of a subroutine of the process of Figure 3.

Figure 7 is a flow chart of a subroutine of the process of Figure 3.

Figure 8 is a flow chart of a subroutine of the subroutine of Figure 3.

Figure 9 is a flow chart of a subroutine of the subroutine of Figure 8.

Figure 10 is a flow chart of a subroutine of the subroutine of Figure 7.

Figure 11 is a flow chart of a subroutine of the subroutine of Figure 7.

Figure 12 is a flow chart of a subroutine of the process of Figure 3 and the subroutine of Figure 8.

Figure 13 is a flow chart of a subroutine of the subroutine of Figure 12.

Figure 14 is a flow chart of a subroutine of the subroutine of Figure 8 and the subroutine of Figure 13.

Figure 15 is a flow chart of an initialization process of the fax peripheral device of Figure 2.

Figure 16 is a flow chart of a power-up process of the fax peripheral device of Figure 2.

Detailed Description of the Invention

The present invention provides a method for enabling and selecting Internet fax transmission when a fax recipient has an Internet address, and an apparatus, in the form of a peripheral device, for enabling and selecting Internet fax transmission when a fax recipient has an Internet address. The peripheral device operates in conjunction with any fax machine to send or receive a fax over the Internet using the Internet Protocol (IP) or over the public telephone lines. The peripheral interfaces with the attached fax machine and enables a sender to send faxes from the fax machine to one or more recipients as a fax over the Internet or over the public telephone lines.

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In the drawings, wherein like numeral indicate like elements, there is shown a fax peripheral device for enabling and selecting Internet fax transmission.

Referring to Figure 1, there is illustrated a networked system, generally referenced by the numeral 10, incorporating the fax peripheral device of the present invention. Specifically, there is illustrated a fax sending station 12. The fax sending station 12 includes a sending fax peripheral device (FPD) 14, a sending fax machine 16 connected to the sending FPD 14 and a network 20 also connected to the sending FPD 14. The network 20 may be a local area network (LAN), an intranet, a wide area network (WAN) or any other equivalent network.

The sending station 12 is connected to a server 22 via the network 20. The server 22 operates as a gateway to the Internet 24. The sending station 12 is also connected to a central office switch 26 of a public switched telephone network (PSTN) 28 via the sending FPD 14.

The system 10 includes a fax receiving station 30. The fax receiving station 30 includes a receiving network 32, a receiving FPD 34, equivalent to the sending FPD 14 and connected to the receiving network 32, and a receiving fax machine 36 also connected to the receiving network 32. The fax receiving station 30 may also include a personal computer (PC) 38 connected to the receiving network 32. The PC 38 may be capable of receiving fax messages, e-mail messages, or both.

The receiving station 30 is connected to a server 40 via the receiving network 32. The server 40 is connected to the Internet 24. The receiving station 30 is also connected to another central office switch 42 of the PSTN 28 via the receiving FPD 34.

The system 10 may also include a third fax machine 44 that is not connected to a fax peripheral device. This fax machine 44 is connected to another central office switch 46 which is in turn connected to the PSTN 28. The system may also include a simple e-mail "box" 48 for receiving e-mail messages. The e-mail box may be maintained on the second server 40.

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The system also includes a central management station 50. The central management station 50 is connected to the Internet 24.

The sending FPD 14 and the receiving FPD 34 may be a discrete, stand alone device or may be integrated into a fax machine. Referring to Figure 2, the sending FPD 14 (or receiving FPD 34) includes a fax port 52 for connecting to the fax machine 16, a telephone port 54 for connecting to the PSTN 28, and a network port 56 for connecting to the network 20. The fax port 52 and the telephone port 54 are standard modular receptacles for receiving a standard modular telephone plug. The network port 56 is a standard interface port for connecting to a computer network. The FPD also includes a LAN card 57 that enables the FPD to connect to the network 20 via the network port 56.

If the FPD is a discrete, stand-alone device, it may also include a input device 58, for example a keyboard, and an output device 60, for example a monitor. The FPD may also be embodied as a two port PC card, for example a PCMCIA card, that may be inserted into a PC (most likely, a laptop computer). One of the two ports of the fax card operates as a fax port for connection to a fax machine (similar to the fax port 52) and the other of the two ports operates as a telephone port for connection to a telephone jack (similar to the telephone port 54) using standard RJ11 jacks. In this case, the PC must also include its own LAN card (similar to the LAN card 57 of the FPD). The LAN card provides the necessary connectivity between the PC and the Internet through an Internet gateway connected to the LAN.

The FPD includes a central processing unit (CPU) 62. The CPU 62 runs the FPD in accordance with an operating program stored in a storage element 64 connected to the CPU 62. The storage element 64 may be a hard disk drive, for example, or any other type of storage element capable of storing an operating program. As described in more detail below, the CPU 62, under direction of the operating program, determines if a fax recipient has an FPD and if so, sends the fax over the Internet, and if not, then sends the fax over the PSTN.

Referring to Figures 1 and 2, the basic operation of the system 10 is as follows. A sender operates the sending fax machine 16 in a standard manner.

The sender inserts a document to be faxed (fax document) into a paper receptacle of the fax machine 16. The sender enters a recipient fax number into the fax machine 16 and instructs the fax machine to transmit the fax document by striking a send key. The sending FPD 14 operates under direction of the CPU 62 in accordance with the operating program. The sending FPD 14 provides a dial tone to the sending fax machine 16 via the fax port 52 and the connection therebetween. The sending FPD 14 receives and accepts the recipient fax number. The fax document is scanned into the fax machine 16 and a graphic image file is created. The graphic image file contains the text and/or graphic information from the fax document. The graphic image file is transferred to the FPD 14 for temporary storage therein. Figure 4 illustrates a flow chart generally detailing the process for inputting a document into the sending fax machine 16 and the sending FPD 14.

Figure 5 illustrates a flow chart detailing a process for sanitizing the recipient fax number for transmission over the Internet. In other words, the process determines a basic ten digit fax number that could correspond to an Internet address by removing a prefix number and/or an international access code number that may be necessary for sending the fax via the PSTN. The CPU 62 performs this process to remove any prefix required to dial past a PBX or similar system and to remove international access digits. Figure 6 illustrates a flow chart detailing a process for determining if the fax machine is being used to make operator assisted voice telephone calls.

As illustrated in Figure 7, the sending FPD 14 searches a local database, maintained in a storage element 66, to determine if the recipient associated with the recipient fax number is equipped to receive faxes via the Internet through an FPD. The database storage element 66 may be a separate storage element or may be combined with the operating program storage element 64. The database storage element 66 may be a hard disk, a programmable memory element or any other type of storage device capable of storing a database. Table 1 represents an example of a record of the local database. The record includes a Fax Number field, a Country Code field, a City Code field, an IP Address field, an E-mail Address field, and a Route Preference field. The Fax Number field stores a

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receiving FPD at the recipient's location. The E-Mail field stores an e-mail address of the recipient. The Route Preference field determines where a recipient prefers to receive the fax, Internet address or e-mail address.

Table 1

Field Name	Description	Field Type	Size (bytes)
FaxNumber	Fax Number for the IFD	Text	13
CountryCode	Country Code where IFD is installed	Text	4
CityCode	City Code for dialing within a country	Text	10
IPAddress	IP Address for IFD	Text	15
EmailAddress	Email Address	Text	20
RoutePreference	IP Address for Email Address	Text	10

The CPU 62 searches the local database to determine if the recipient fax number matches any of the numbers stored in the Fax Number field of each record. If a match for the recipient fax number is found, the CPU 62 selects the Internet for transmitting the graphic image file and retrieves the recipient's record.

Figure 8 illustrates a flow chart for sending the fax via the Internet. The CPU 62 determines whether to send the graphic image file to an Internet address or an e-mail address based upon the recipient's preference. If the recipient prefers to receive the graphic image file at an Internet address, the CPU 62 retrieves the associated Internet address of the receiving FPD 34 and packages the graphic image file for transmission over the Internet to the receiving FPD 34. The CPU 62 uses a standard protocol to package the graphic image file for transmission over the Internet. The packaging of the graphic image file may also include encrypting the data for security purposes. Upon receipt of the graphic image file, the receiving FPD 34 establishes a connection with the receiving fax machine 36. The graphic image file is unpackaged and is transmitted to the receiving fax machine 36 for data file was encrypted prior to transmission.

The recipient fax number may also have an associated e-mail address. The e-mail address may be for a recipient connected to the LAN 32 through a PC 38, or who simply has an e-mail account or "box" associated with a server 40. If the recipient prefers to receive the graphic image file at an e-mail address the CPU 62 retrieves the associated e-mail address and packages the graphic image file for transmission as an attachment to an e-mail message using a standard e-mail protocol, for example a Mail Application Programming Interface (MAPI) envelope. Figure 9 illustrates a flow chart depicting an e-mail delivery process.

If a match for the recipient fax number is not found, the CPU 62 establishes a connection with the central management station 50 via the LAN 20 and the Internet 24. The central management station 50 maintains a composite central database of all FPDs. Table 1 also represents a database of FPDs maintained as part of the central database. The central database is updated with each new installation of an FPD through an initialization process described in more detail below. Figure 10 illustrates a flow chart depicting a process for querying the central database. The CPU 62 queries the central management station 50 and the central database to determine if the recipient fax number matches any of the numbers stored in the Fax Number field of each record. If a match for the recipient fax number is found, the central management station 50 sends a corresponding record to the sending FPD 14. If a match for the recipient fax number is not found, the central management station 50 sends a message indicating that no match was found. Once the central management station is queried, the sending FPD 14 must be updated, either with the record corresponding to recipient fax number or the message that a record corresponding to the recipient fax number was not found in the central database.

Figure 11 illustrates a flow chart depicting the process for updating the local database. The CPU 62 then retrieves the associated Internet address of the receiving FPD 34 from the updated local database and packages the graphic image file for transmission over the Internet to the receiving FPD 34. Referring again to Figure 7, once the local database is updated, if a record is received from the central

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information without connecting to the central management station 50.

Still referring to Figure 7, if a match for the recipient fax number is not found in either the local database or the central database, the CPU 62 selects the PSTN for transmitting the graphic image file. Referring to Figure 12, the CPU 62 replaces any numbers that were stripped out for transmission over the Internet. Referring to Figure 13, the CPU 62 then establishes a direct connection with the receiving fax machine 44 using standard fax protocols. The graphic image file is transmitted over the PSTN 28 to the receiving fax machine 44. Regardless of how the graphic image file is packaged, once the CPU 62 determines the route the file will take to reach the recipient, the graphic image file is transmitted via the best, available route.

As illustrated in Figure 8, if the sending FPD 14 attempts to transmit the graphic image file via the Internet 24 and is unable to successfully transmit the graphic image file after requeuing the fax delivery, as detailed in Figure 14, the sending FPD 14 informs the central management station 50 that it was unable to deliver the graphic image file over the Internet to the Internet address. The CPU 62 of the sending FPD 14 must then select an alternate route to send the graphic image file. If an e-mail address is available, the CPU 62 selects this alternative and the graphic image file is sent to the e-mail address as described above. If an e-mail address is not available the CPU 62 selects the PSTN and the graphic image file is sent, as described above, via the central office switch 26, the PSTN 28 and another central office switch 42 to the recipient fax machine 36. A direct connection between the sending fax machine 16 and the receiving fax machine 36 is established and the graphic image file is packaged and transmitted. The central management station 50 may then contact the recipient to inform him/her that a sender was unable to establish an Internet connection. This enables the central management station 50 to provide a trouble shooting warning or service to an FPD-equipped recipient.

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An FPD can be physically installed and integrated into the network system very simply. In order to physically install a stand alone FPD, a user simply connects an output line from a fax machine that normally connects to a telephone jack to the fax port 52 of the FPD, connects an output line from the telephone port 54 of the FPD to the telephone jack, and connects a line from the network port 56 to the LAN 20 as illustrated in Figure 2. Once the FPD is physically connected, the user inputs an installation/initialization application program to any PC on the network 20. The installation/initialization application program may be input using a floppy disk, an optical disk or any other means for transferring an executable program to the PC. Upon execution of the installation/initialization program, the PC will communicate with the FPD to obtain a unit number that uniquely identifies the particular FPD. The installation/initialization program will request various pieces of information for specifying the identity of the particular user. Most importantly, this information includes an Internet address for the FPD and a corresponding recipient fax number. The Internet address and the recipient fax number are stored in a local identity record for the FPD corresponding to the record of Table 1. Figure 15 illustrates a flow chart corresponding to the installation/initialization program process. Table 2 sets forth a local identity record for the sender/recipient including several fields for identifying the sender/recipient.

Table 2

Field Name	Description	Field Type	Size (bytes)
CompanyName	Company Name	Text	50
SupportEMail	Email Address of Support Person	Text	50
SupportPhNum	Phone Number for Support Person	Text	13
FirstName	First Name	Text	20
MiddleInitial	Middle Initial	Text	1
LastName	Last Name	Text	50
BusinessAddress1	Business Address 1	Text	100
BusinessAddress2	Business Address 2	Text	100
BusinessCity	City	Text	20
BusinessStateID	State	Text	2
BusinessCountry	Business Country	Text	50

When the FPD is first activated it will go through a power-up process in which the CPU 62 attempts to establish a connection to the central management station 50. Once the connection between the FPD and the central management station 50 is established, the CPU 62 transmits the two local identity records and the unit number to the central management station 50 for storage in the central database. Simply transmitting the two local identity records and the unit number to the central database registers the particular FPD with the central management station 50. Therein, if a sending FPD does not have a newly registered FPD in its local database, the sending FPD will now be able to obtain the necessary information regarding the newly registered FPD for transmitting a fax via the Internet by querying the central management station 50, as described above. In this manner, every FPD may obtain the information necessary for transmitting a fax via the Internet to every other FPD. Figure 16 illustrates a flow chart for the power-up process.

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If a fax recipient wishes to utilize the present system only through an e-mail address, he/she must provide the necessary information, including his/her e-mail address to the central management station. This may be accomplished by accessing a web site maintained by the central management station via the Internet using a web browser. The fax recipient will be allocated a fax number that will be associated with his/her e-mail address. The fax recipient will also provide additional information in order to complete the identity records. In this manner, the fax recipient may receive faxes via the Internet without the use of an FPD.

The FPD is also capable of monitoring and cataloging all fax transactions that occur using the FPD in a local transaction database. Table 3 depicts a transaction record of the transaction database for each transaction that occurs using the FPD. Each time a fax is sent using the FPD, a new transaction record is created. At various times, either after every fax transaction or during scheduled intervals, the FPD connects to the central management station and updates a central transaction database with the transaction records from the local transaction database. The central transaction database is also made up of transaction records as depicted in Table 3. The central transaction database enables the central management station to track fax activity for future marketing or network infrastructure purposes.

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Table 3

Field Name	Description	Field Type	Size (bytes)
SenderFaxNumber	Fax Number for the IFD	Text	13
SenderCountryCode	Country Code where IFD is installed	Text	4
SenderCityCode	City Code for dialing within a country	Text	10
SenderIPAddress	IP Address for IFD	Text	15
SenderEmailAddress	Email Address for the IFD	Text	20
RecipientFaxNumber	Fax Number for the IFD	Text	13
RecipientCountryCode	Country Code where IFD is installed	Text	4
RecipientCityCode	City Code for dialing within a country	Text	10
RecipientIPAddress	IP Address for IFD	Text	15
RecipientEmailAddress	Email Address for the IFD	Text	20
FaxNumberofPage	Number of Pages of Fax Message	Text	3
FaxDuration	Duration in Seconds for Fax Transmittal	Text	8
FaxOverIP	Whether Fax was sent over IP (Valid Y/N)	Text	1

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification, as indicating the scope of the invention.

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Claims:

1. A method for enabling and selecting Internet fax transmission when a fax recipient is equipped to receive faxes via the Internet, comprising the steps of:

receiving fax data from a fax machine in a fax peripheral device, the fax data including a recipient fax number and a graphic image file;

maintaining a local database of Internet fax-equipped recipients in the fax peripheral device, the local database including a record for each Internet fax-equipped recipient, each record including a fax number and an associated Internet address;

searching the local database for the recipient fax number;

if the recipient telefax number is in the local database, packaging the graphic image file for transmission over the Internet to the Internet address associated with the recipient fax number;

if the recipient telefax number is not in the local database, querying a central management station via the Internet to determine if the recipient fax number is in a central database maintained in the central management station;

if the recipient fax number is in the central database, receiving an Internet fax-equipped recipient record of the central database from the central management station, updating the local database with the received central database Internet fax-equipped recipient record, packaging the graphic image file for transmission over the Internet to the Internet address associated with the recipient fax number of the record received from the central management station;

if the recipient fax number is not in the central database, packaging the graphic image file for transmission over the public telephone network to the recipient telefax number; and

transmitting the packaged graphic image file.

2. A method for enabling and selecting Internet fax transmission as recited in claim 1, further comprising the step of initializing the fax

peripheral device when the fax peripheral device is initially installed and powered up.

3. A method for enabling and selecting Internet fax transmission as recited in claim 2, wherein the step of initializing the fax peripheral device comprises the steps of establishing an Internet connection with the central management station, transmitting a unit number for the fax peripheral device, a fax number associated with the fax peripheral device and an Internet address associated with the fax peripheral device to the central management station, storing the transmitted unit number, fax number and Internet address in an Internet fax-equipped recipient record in the central database.

4. A method for enabling and selecting Internet fax transmission as recited in claim 1, further comprising the steps of confirming that an Internet transmission is received by the fax recipient, and if the Internet transmission is not received by the fax recipient informing the central management station of the failure to successfully transmit via the Internet.

5. A method for enabling and selecting Internet fax transmission as recited in claim 4, further comprising the step of packaging the graphic image file for transmission over the public telephone network if the Internet transmission is not successfully received by the fax recipient and transmitting the packaged graphic image file via the public telephone network.

6. A method for enabling and selecting Internet fax transmission as recited in claim 1, wherein the Internet fax-equipped recipient record includes an e-mail address and the graphic image file is packaged for transmission over the Internet to the e-mail address.

7. An apparatus for enabling and selecting Internet fax transmission when a fax recipient is equipped to receive Internet faxes, comprising:

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an input for receiving data from a fax machine, the data including a recipient fax number and a graphic image file;

an output for connecting to the Internet;

an output for connecting to the public telephone network;

a storage element maintaining a local database of Internet fax-equipped recipients, the local database including a record for each Internet fax-equipped recipient, each record including a fax number and an associated Internet address; and

a processor programmed to:

(a) search the local database for the recipient fax number;

(b) if the recipient fax number is in the local database, package the graphic image file for transmission over the Internet to the Internet address associated with the recipient fax number, and transmit the packaged graphic image file;

(c) if the recipient fax number is not in the local database, query a central database via the Internet for the recipient fax number, and

(i) if the recipient fax number is in the central database, receive an Internet fax-equipped recipient record from the central database, update the local database with the central database Internet fax-equipped recipient record, and package the graphic image file for transmission over the Internet to the Internet address associated with the recipient fax number received from the central database, and transmit the packaged graphic image file;

(ii) if the recipient fax number is not in the central database, allow the fax machine to package the graphic image file for transmission over the public telephone network to the recipient fax number, and transmit the packaged graphic image file.

8. An apparatus for enabling and selecting Internet fax transmission as recited in claim 7, wherein the processor is programmed to initialize the apparatus when the apparatus is initially installed and powered up.

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transmission as recited in claim 8, wherein, upon initialization of the apparatus, the processor is programmed to (i) establish an Internet connection with a central management station and (ii) transmit a unit number for the apparatus, a fax number associated with the apparatus and an Internet address associated with the apparatus to the central management station for storage in an Internet fax-equipped recipient record of a central database.

10. An apparatus for enabling and selecting Internet fax transmission as recited in claim 7, wherein the processor is programmed to confirm that an Internet transmission is received by the fax recipient, and if the Internet transmission is not received by the fax recipient inform a central management station of the failure to successfully transmit via the Internet.

11. An apparatus for enabling and selecting Internet fax transmission as recited in claim 10, wherein, if the Internet transmission is not successfully received by the fax recipient, the processor is programmed to connect the fax machine to a receiving fax machine and allow the fax machine to package the graphic image file for transmission over the public telephone network and transmit the graphic image file via the public telephone network to the receiving fax machine.

12. An apparatus for enabling and selecting Internet fax transmission as recited in claim 7, wherein the Internet fax-equipped recipient record includes an e-mail address and the processor is programmed to package the graphic image file for transmission over the Internet to the e-mail address.

13. A system for Internet faxing, comprising:

a central management station, connected to the Internet, comprising a storage element maintaining a central database of all registered Internet fax-equipped recipients, the central database including a record for each registered

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Internet fax-equipped recipient, each record including a fax number and an associated Internet address;

a fax sending station, connected to the Internet, including a sending, Internet-fax component, the sending, Internet-fax component comprising

an input for receiving fax data, the fax data including a recipient fax number and a graphic image file,

an output for transmitting the graphic image file over the Internet;

a storage element maintaining a local database of Internet fax-equipped recipients known to the sending station, the local database including a record for each known Internet fax-equipped recipient, each record including a fax number and an associated Internet address;

a processor, connected to the input, programmed

to search the local database for the recipient fax number,

to package the graphic image file for transmission over the Internet to the Internet address associated with the recipient fax number, if the recipient fax number is in the local database,

to search the central database via the Internet for the recipient fax number, if the recipient fax number is not in the local database,

to receive an Internet fax-equipped recipient record from the central database, to update the local database with the received central database Internet fax-equipped recipient record, to package the graphic image file for transmission over the Internet to the Internet address associated with the recipient fax number received from the central database, if the recipient fax number is in the central database, and

to transmit the packaged graphic image file;

number, for receiving the packaged graphic image file.

14. A system for Internet faxing as recited in claim 13, wherein the processor is programmed to initialize the Internet-fax component when the Internet-fax component is initially installed and powered up.

15. A system for Internet faxing as recited in claim 14, wherein, upon initialization of the Internet-fax component, the processor is programmed to (i) establish an Internet connection with the central management station and (ii) transmit a unit number for the Internet-fax component, a fax number associated with the Internet-fax component and an Internet address associated with the Internet-fax component to the central management station for storage in an Internet fax-equipped recipient record of the central database.

16. A system for Internet faxing as recited in claim 13, wherein the processor is programmed to confirm that an Internet transmission is received by the fax recipient, and if the Internet transmission is not received by the fax recipient inform the central management station of the failure to successfully transmit via the Internet.

17. A system for Internet faxing as recited in claim 16, wherein the fax sending station includes a sending fax machine and the fax receiving station includes a receiving fax machine and wherein, if the Internet transmission is not successfully received by the fax recipient, the processor is programmed to connect the sending fax machine to the receiving fax machine and allow the sending fax machine to package the graphic image file for transmission over the public telephone network and transmit the graphic image file via the public telephone network to the receiving fax machine.

18. A system for Internet faxing as recited in claim 13, wherein the Internet fax-equipped recipient record includes an e-mail address and the processor is programmed to package the graphic image file for transmission over the Internet to the e-mail address.

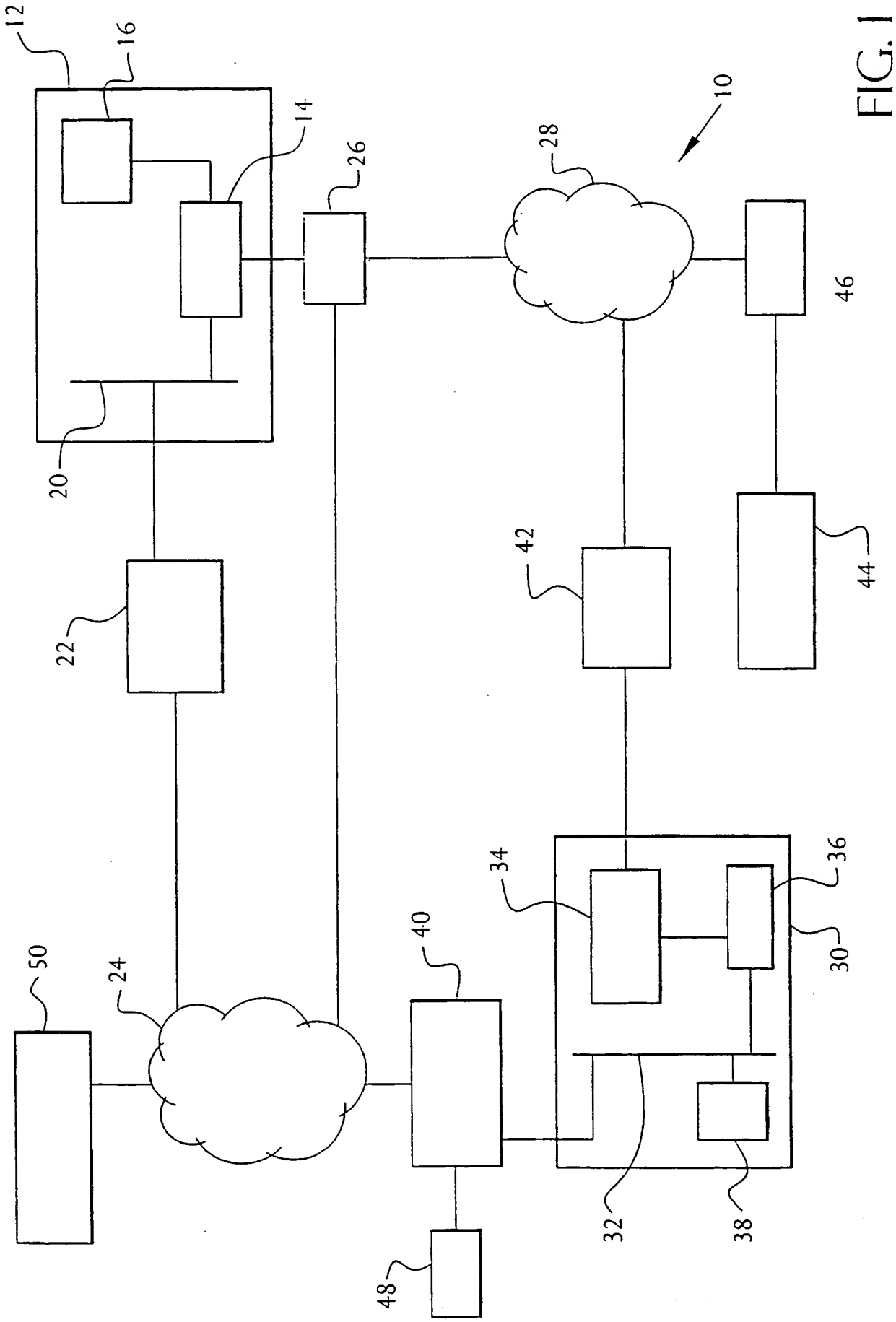

FIG. 1

WSDOCID: <WO___0035185A1_I_>

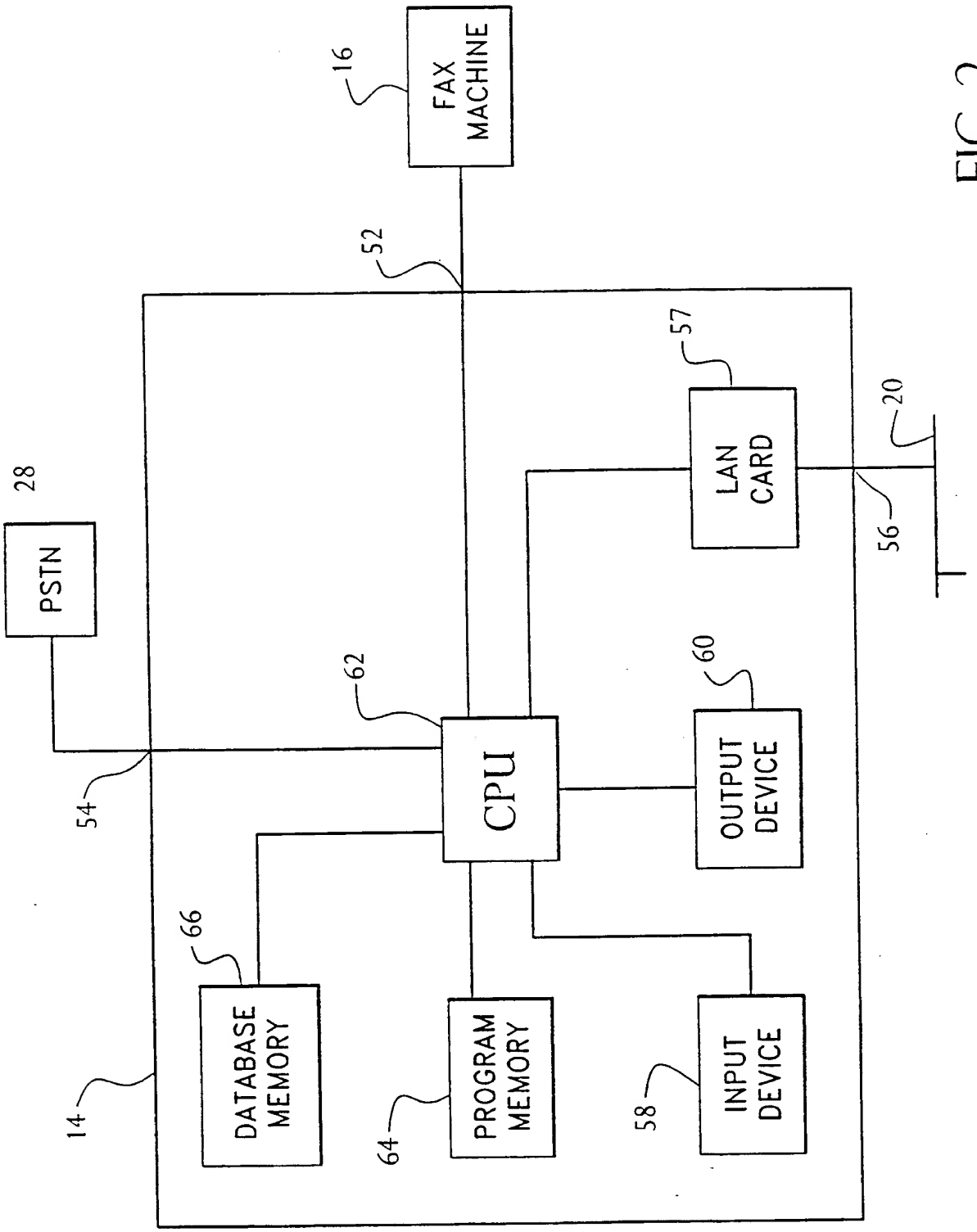

FIG. 2

SDOCID: <WO___0035185A1_I_>

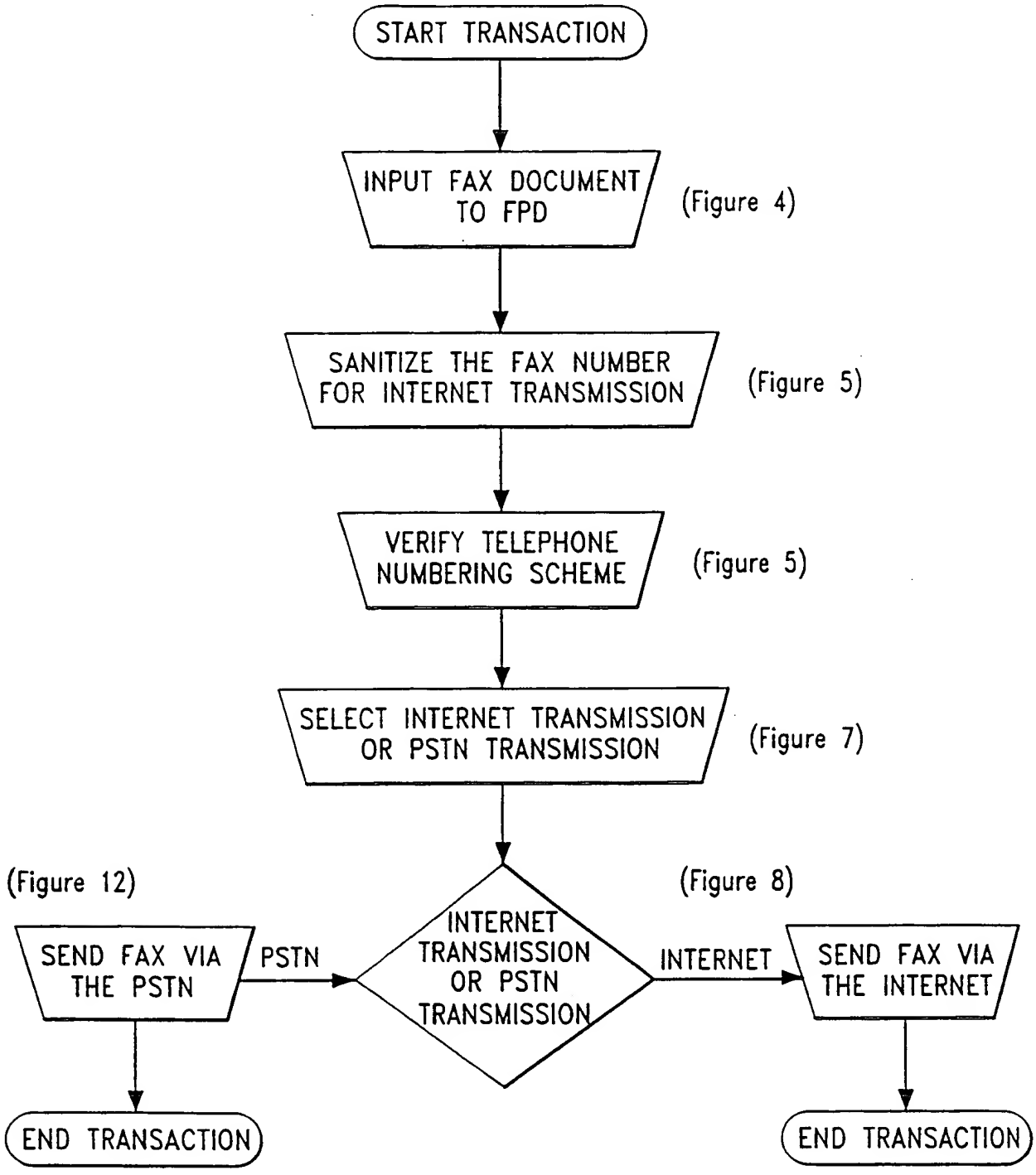

FIG. 3

NSDOCID: <WO___0035185A1_I_>

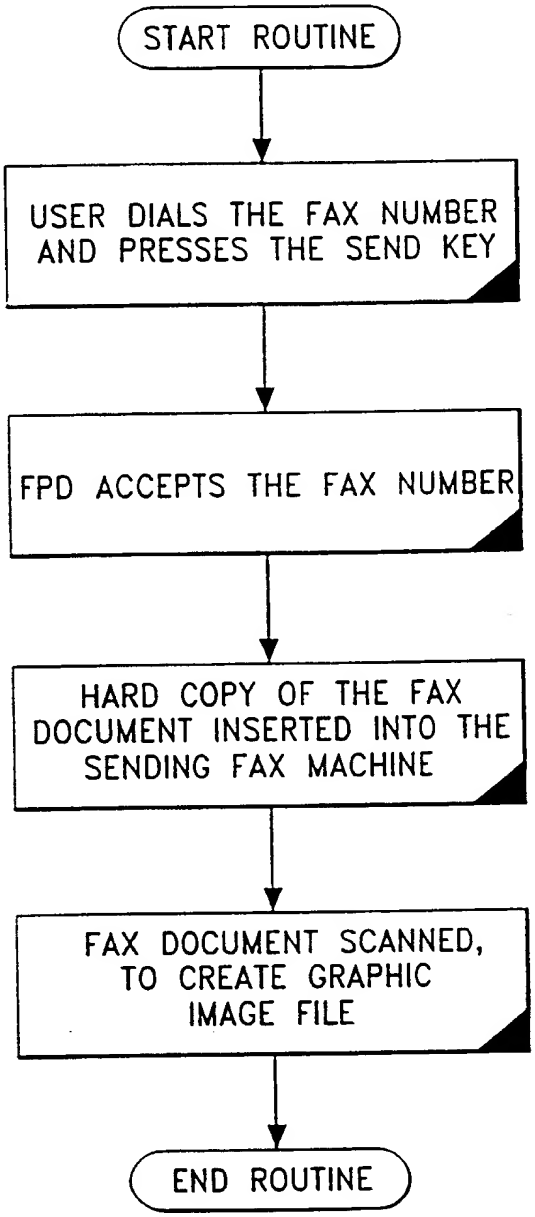

FIG. 4

SDOCID: <WO___0035185A1_I_>

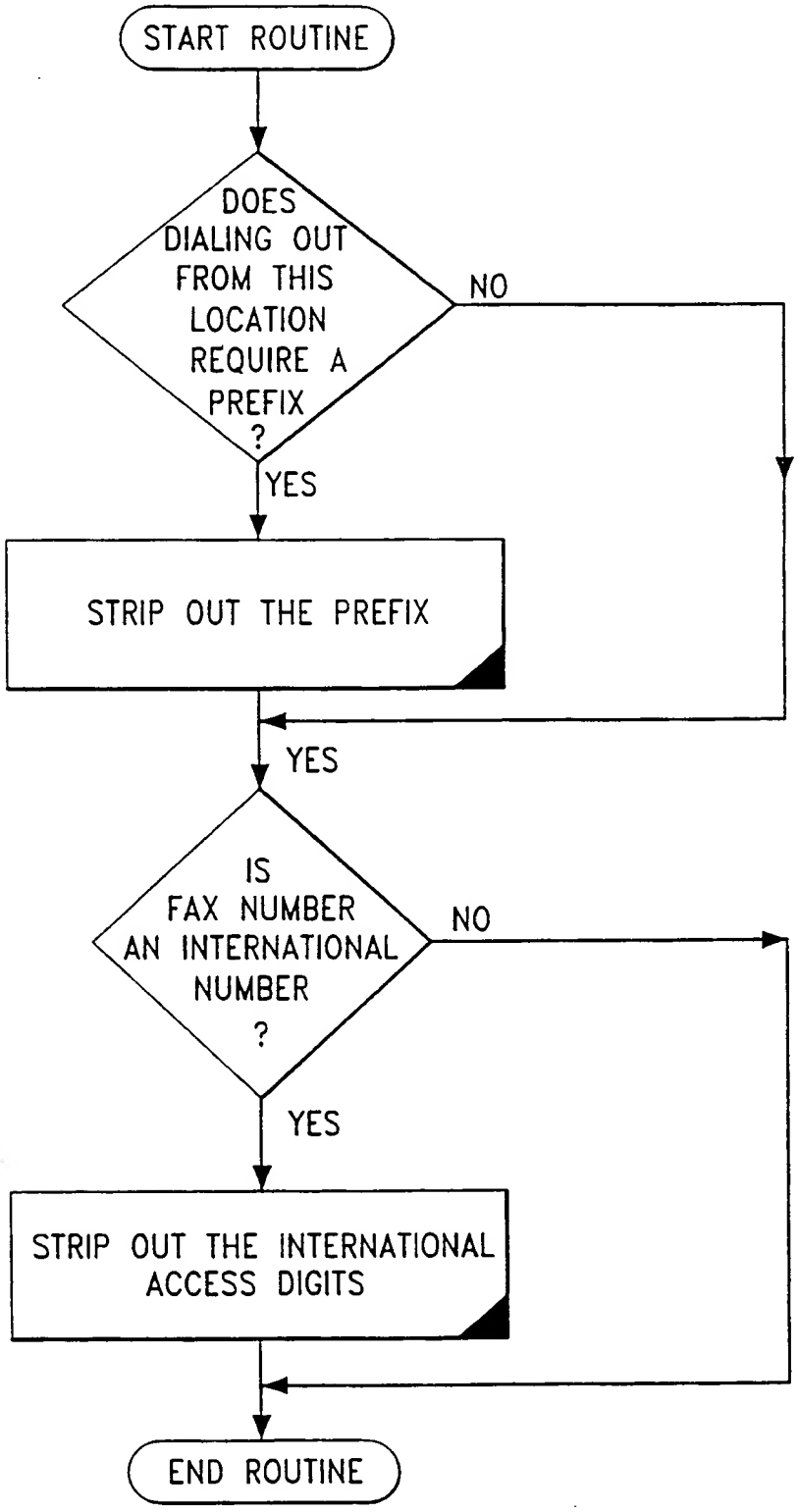

FIG. 5

WSDOCID: <WO___0035185A1_I_>

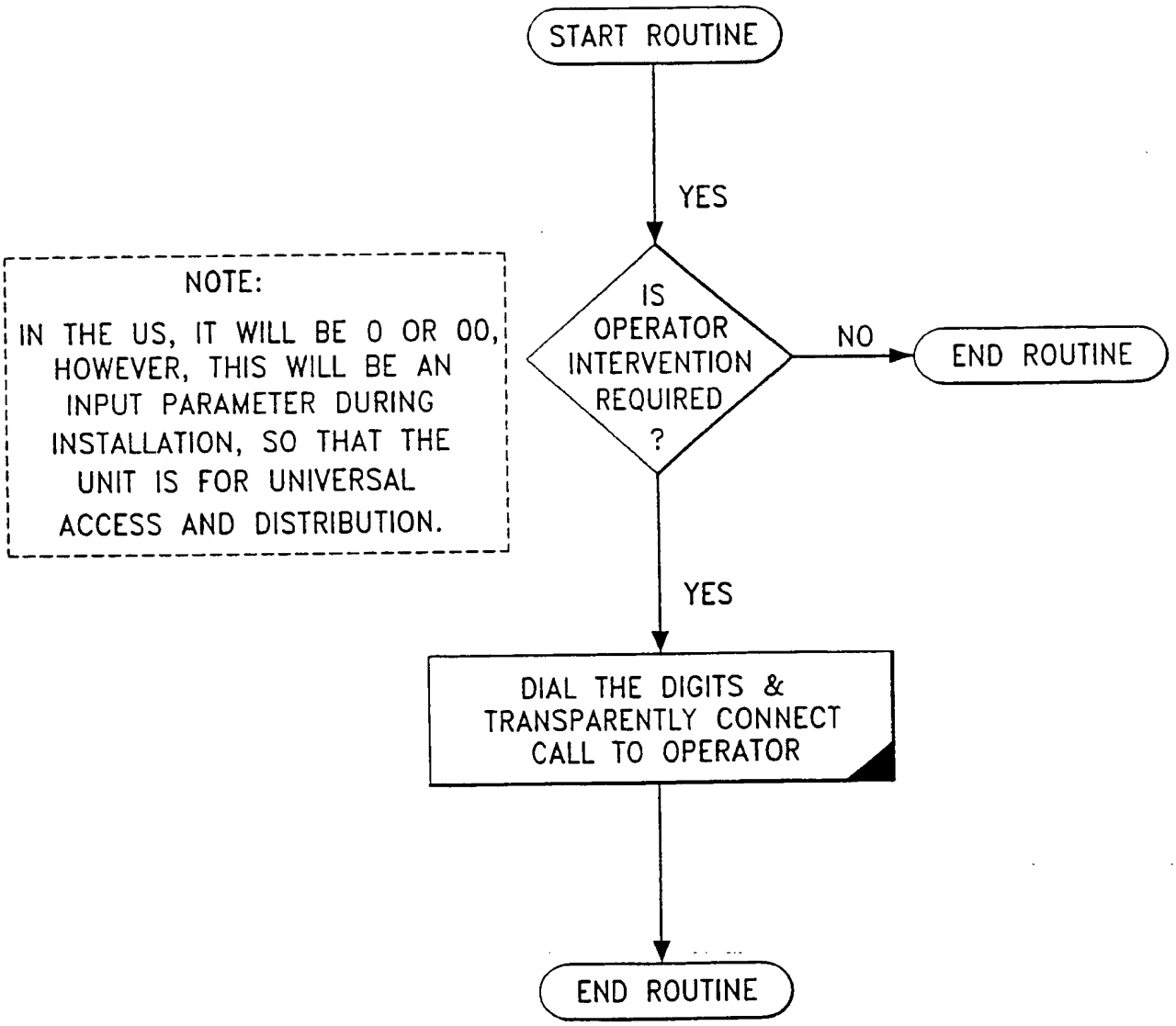

FIG. 6

SDOCID: <WO___0035185A1_I_>

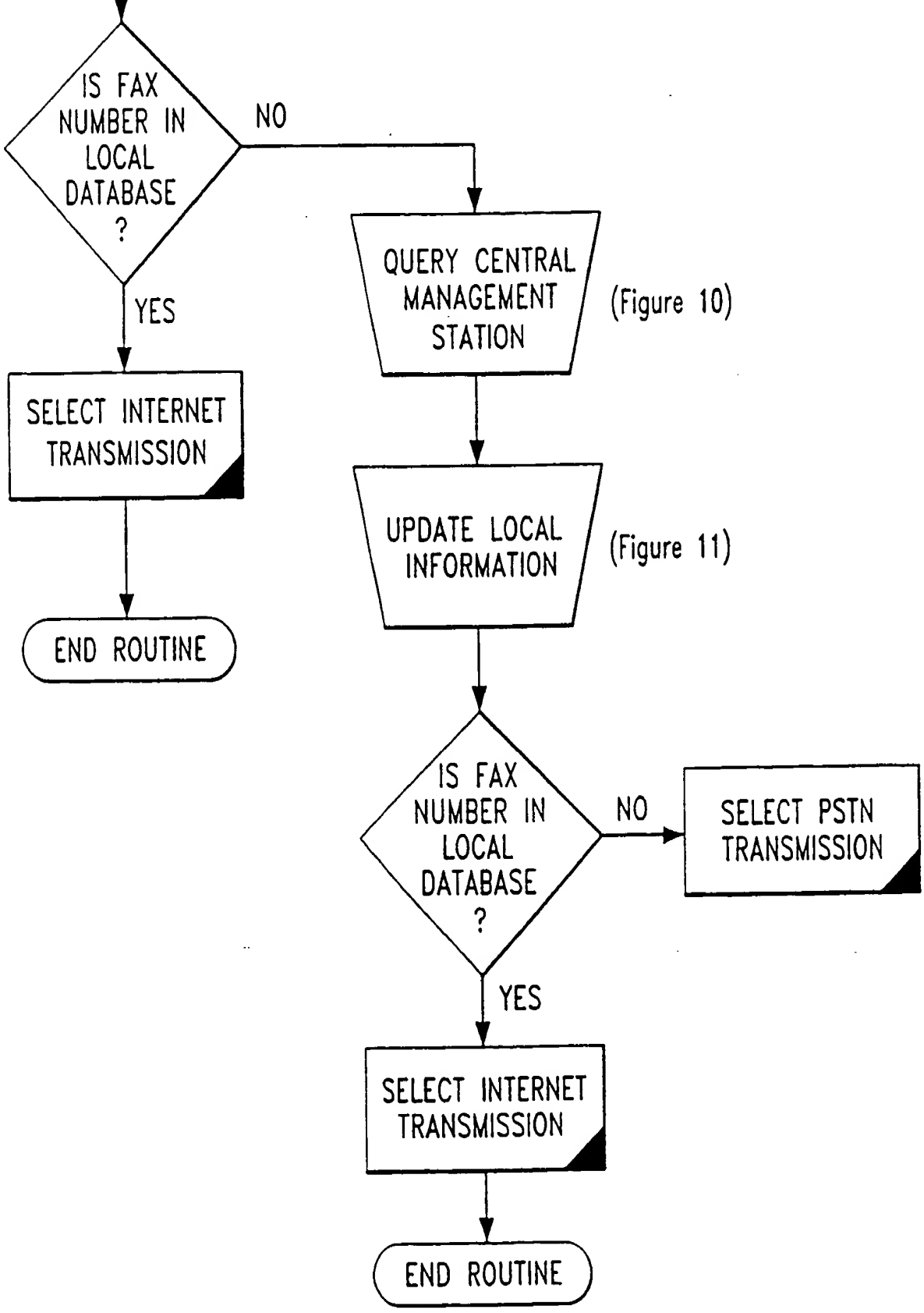

FIG. 7

\SDOCID: <WO___0035185A1_I_>

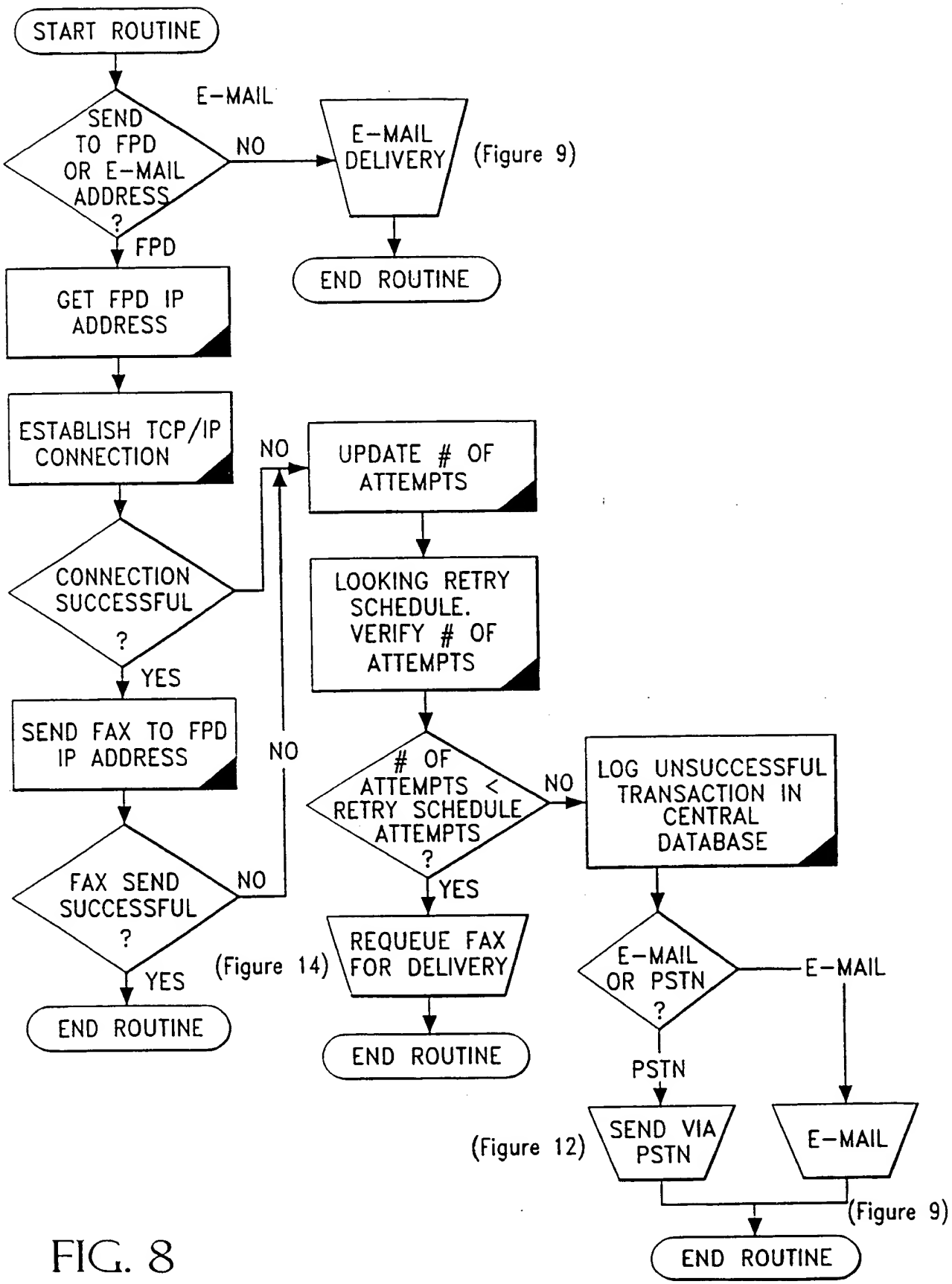

FIG. 8

SDOCID: <WO___0035185A1_I_>

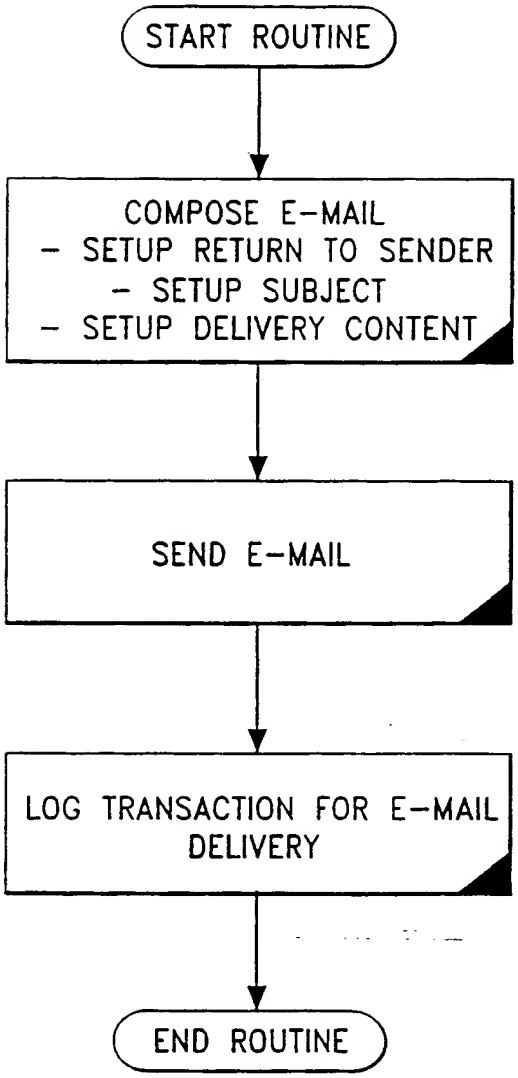

FIG. 9

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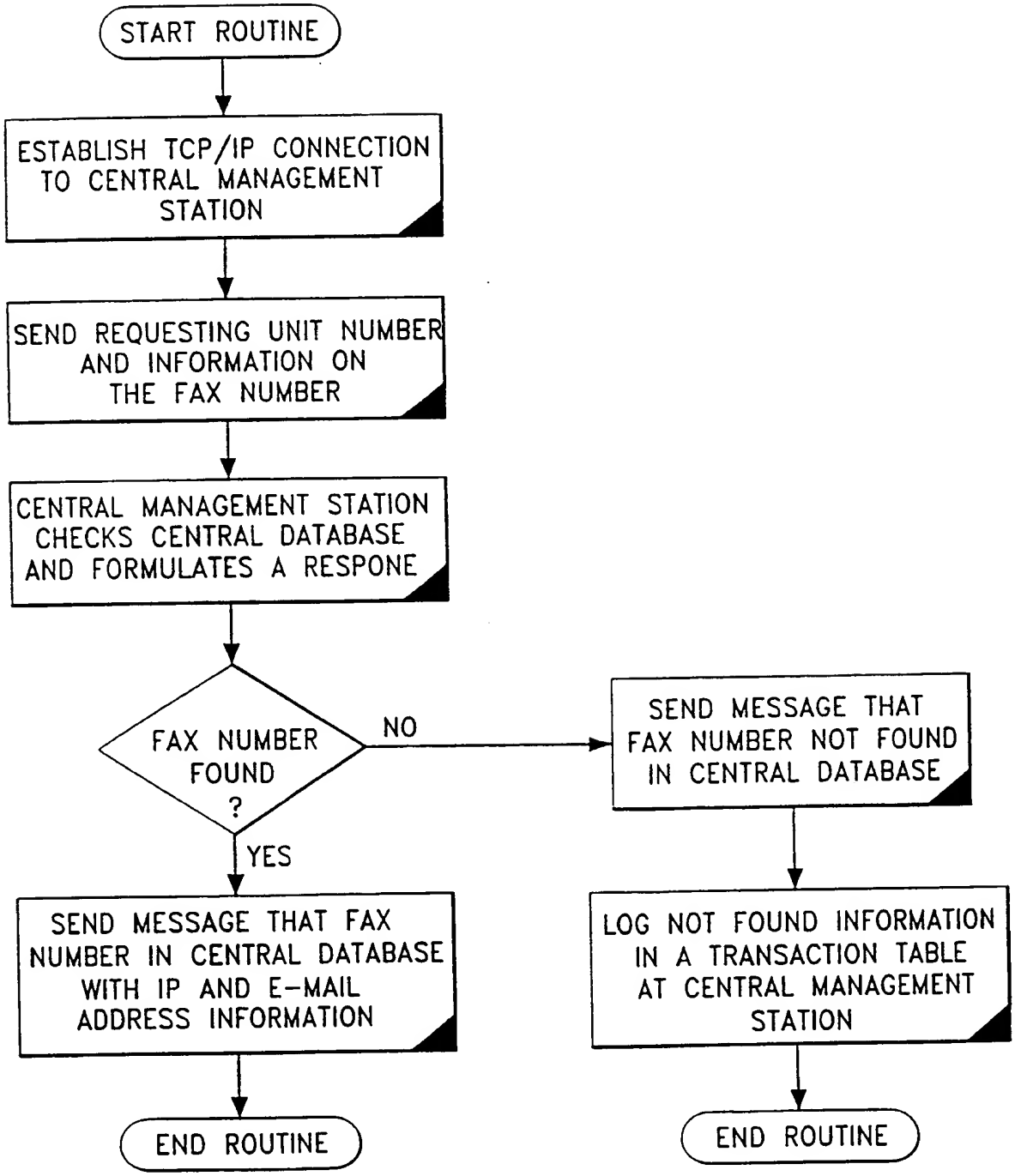

FIG. 10

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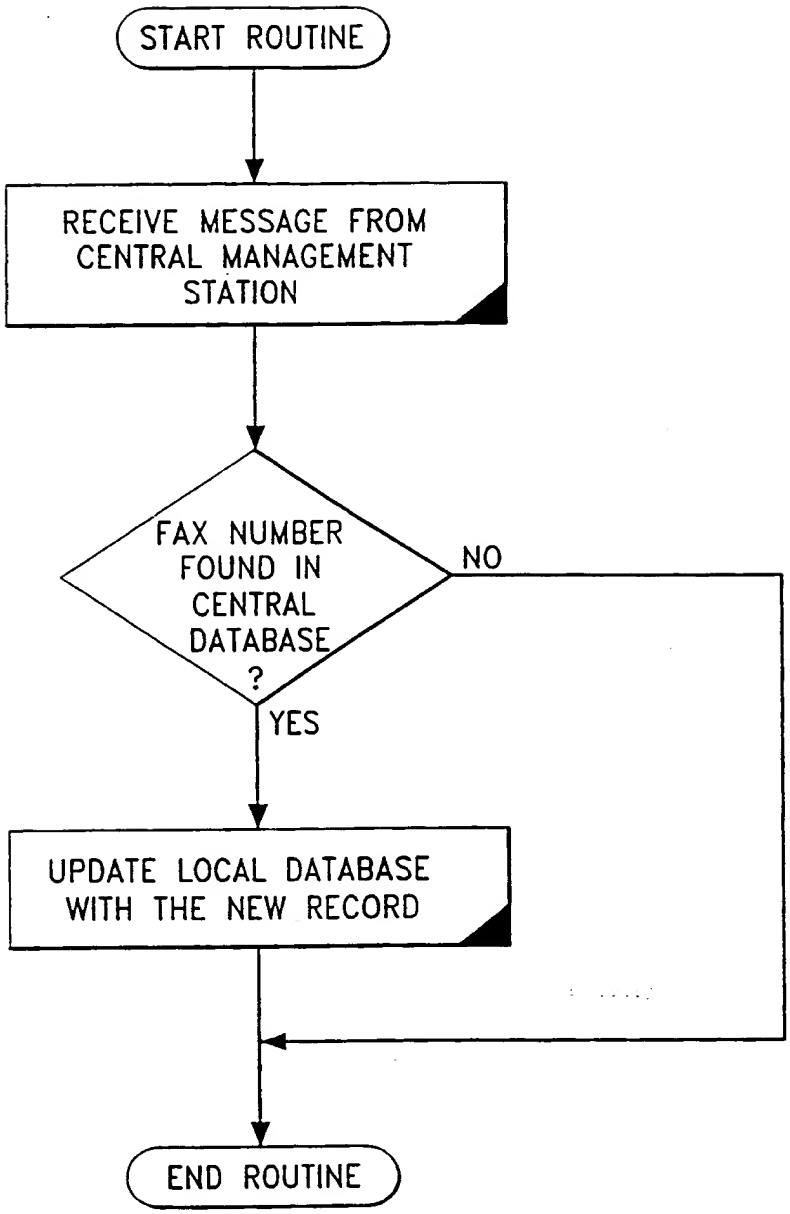
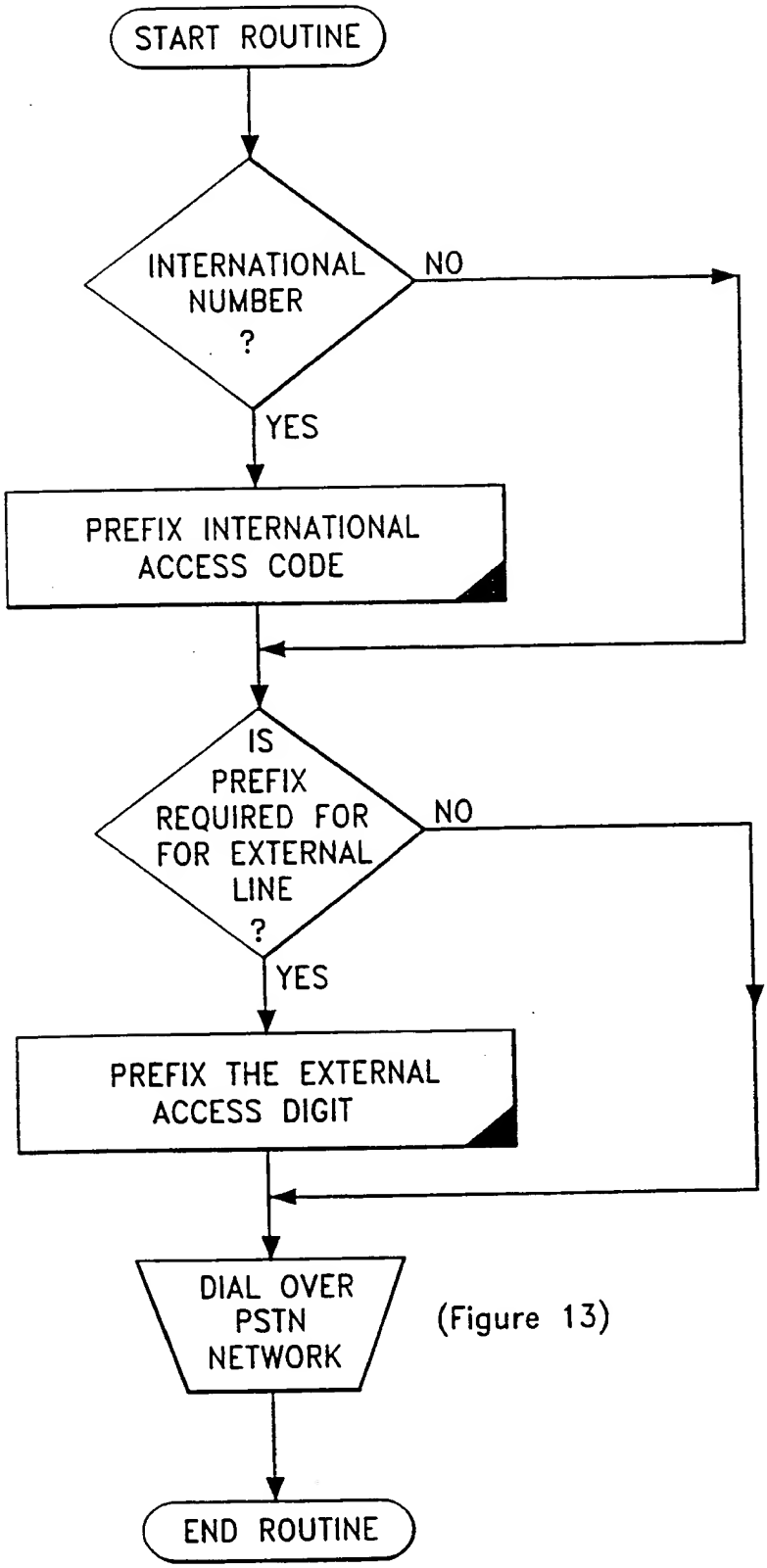


FIG. 11

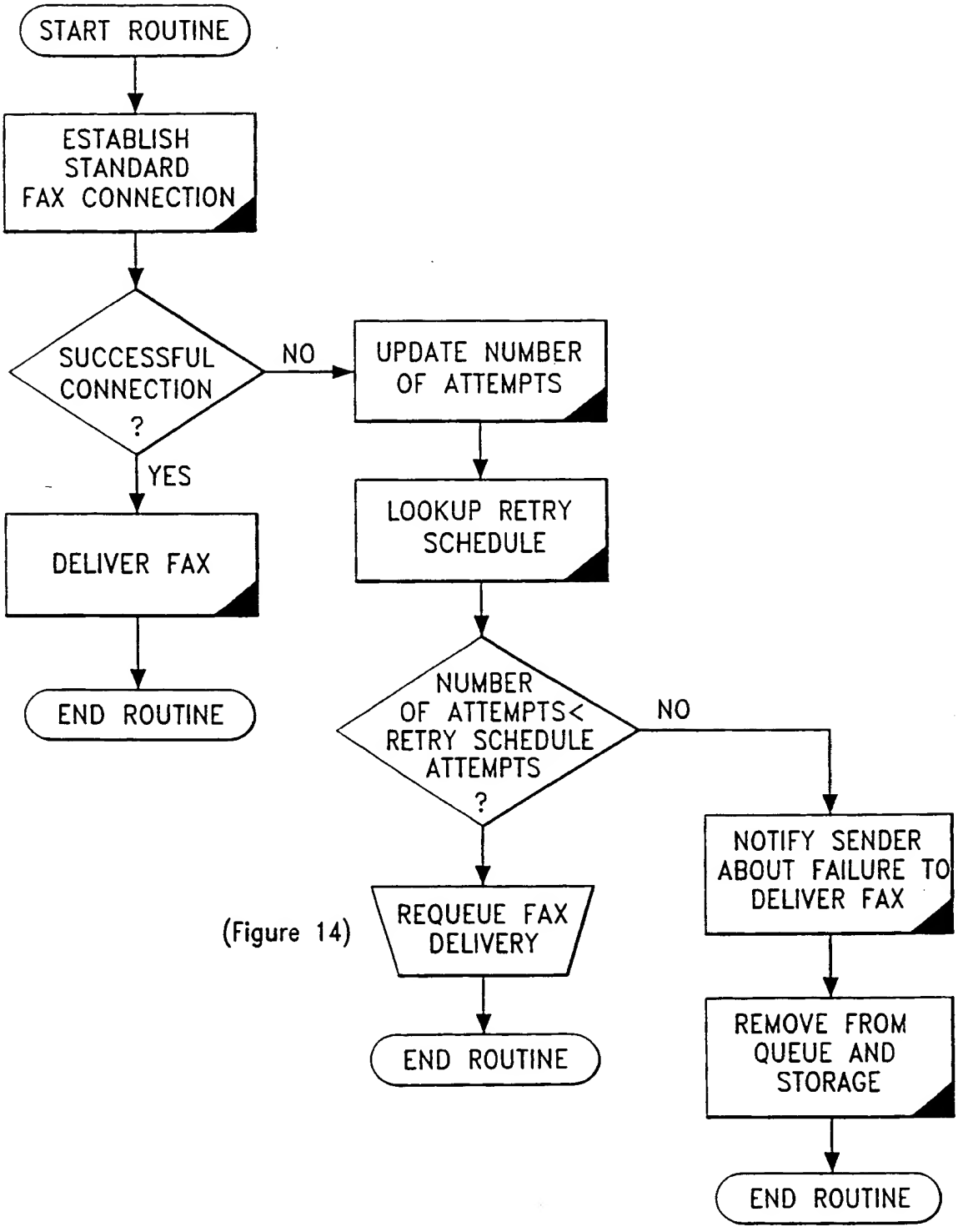
NSDOCID: <WO___0035185A1_I_>



(Figure 13)

FIG. 12

SDOCID: <WO___0035185A1_I_>



(Figure 14)

FIG. 13

NSDOCID: <WO___0035185A1_I_>

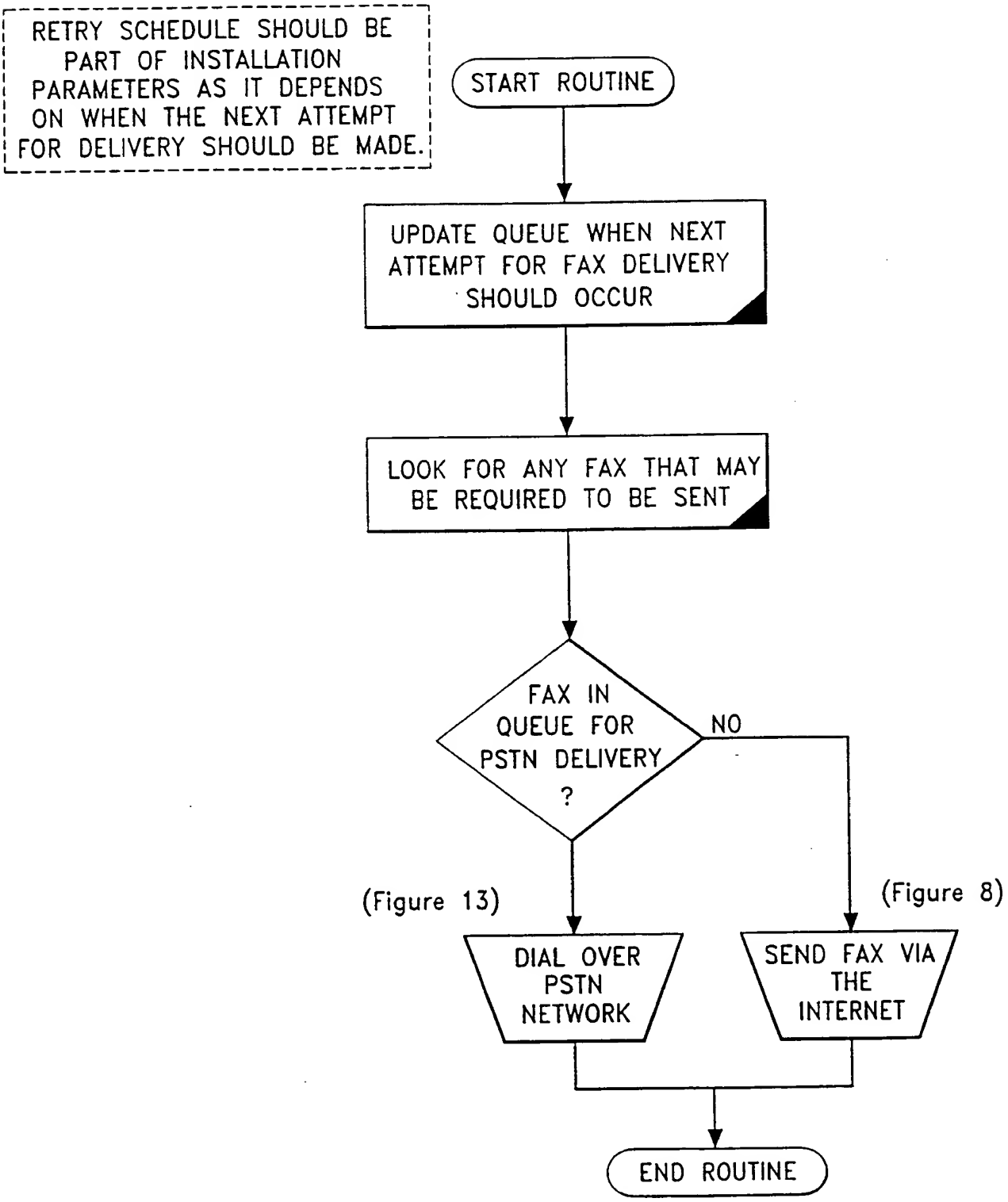


FIG. 14

SDOCID: <WO___0035185A1_I_>

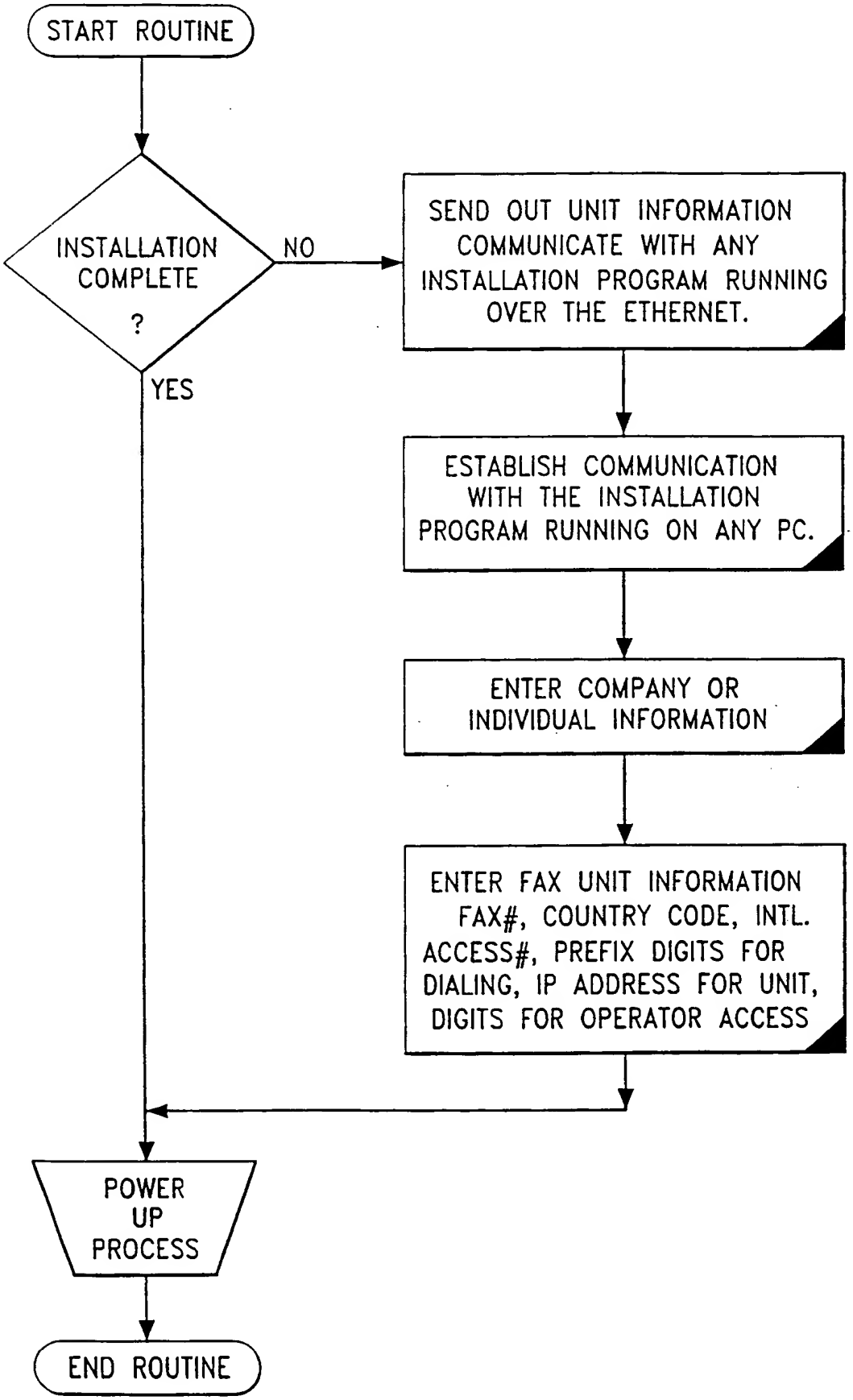


FIG. 15

\SDOCID: <WO___0035185A1_I_>

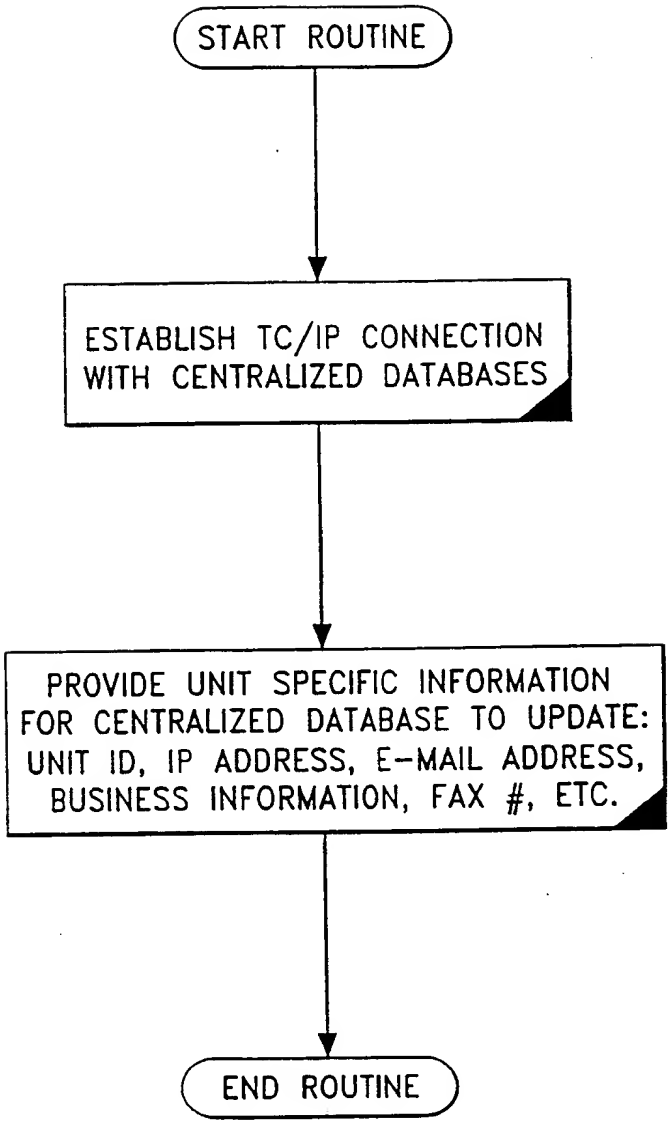


FIG. 16

SDOCID: <WO___0035185A1_I_>

INTERNATIONAL SEARCH REPORT

Int. tional application No.
PCT/US99/28900

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :H04N 1/00
US CL :358/1.15, 407; 379/100.09; 709/239

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 358/1.15, 402, 407, 440, 442, 468; 709/238, 239, 240, 242; 379/100.08, 100.09, 100.17

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EAST
facsimile, internet, PSTN, database

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,754,640 A (SOSNOWSKI) 19 MAY 1998, see entire document.	1, 7, 13
Y	WO 97/10668 A (KULAKOWSKI) 20 MARCH 1997, see entire document.	1-18
Y	US 5,513,126 A (HARKINS et al) 30 APRIL 1996, see entire document.	1-3, 6-9, 12-15, 18
Y	US 5,815,669 A (LEE et al) 29 SEPTEMBER 1998, see entire document.	1, 2, 7, 8, 13, 14
Y	US 5,812,278 A (TOYODA et al) 22 SEPTEMBER 1998, see cols. 21-29.	1, 6, 7, 12, 13, 18
Y	US 5,826,034 A (ALBAL) 20 OCTOBER 1998, see entire document.	1, 4-7, 10-13, 16-18

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 13 MARCH 2000	Date of mailing of the international search report 08 MAY 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer JOSEPH R. POKRZYWA Joni Hill Telephone No. (703) 305-3800/4700

Form PCT/ISA/210 (second sheet) (July 1998)*

NSDOCID: <WO___0035185A1_I_>

INTERNATIONAL SEARCH REPORT

In ational application No. PCT/US99/28900

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,826,034 A (ALBAL) 20 OCTOBER 1998, see entire document.	1, 4-7, 10-13, 16-18
Y, P	US 5,862,202 A (BASHOURA et al) 19 JANUARY 1999, see entire document.	1, 6, 7, 12, 13, 18
A	US 5,712,907 A (WEGNER et al) 27 JANUARY 1998, see entire document.	1-18
A	US 5,793,498 A (SCHOLL et al) 11 AUGUST 1998, see entire document.	1-18

SDOCID: <WO___0035185A1_I_>

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